CCRIMH PUB. 29

CLINICAL STUDY OF ZEEQ-UN-NAFAS

CLINICAL RESEARCH UNIT (UNANI) MADRAS

Under

CENTRAL COUNCIL FOR RESEARCH IN INDIAN MEDICINE AND HOMOEOPATHY

NEW DELHI

Clinical Study
of
Zeeq-un-Nafas
(Bronchial Asthma)
with
Gajga (Karanjwa), Karanj, and Majoon-e-Zeeq

By
Dr. S.G. Mohiuddin
Research Officer
Dr. (Mrs.) Gowhar Sultana
Research Assistant
Dr. S.K. Khadri
Project Officer

at
Clinical Research Unit (Unani)
Arignar Anna Govt. Hospital of Indian Medicine, Madras

Central Council for Research in Indian Medicine and Homoeopathy
(Min. of Health & Family Welfare)
Govt. of India

CCRIMH/Pub. 29

(Copy Right CCRIMH)

Ist Edition
1977
1000 Copies

Published by

Central Council for Research in Indian
Medicine and Homoeopathy
E/25, Defence Colony
New Delhi-110024.

FOREWORD

Right from its inception, the sole aim of the Council, besides its other motives, had been to find out effective, cheaper and easily procurable indigenous remedies for the common man. In consonance with its aims and objects, the Council established a Clinical Research Unit at Arignar Anna Govt. Hospital of Indigenous Medicine, Madras. to conduct clinical trial of single as well as compound Unani drugs on the problems of vital importance.

The present work on Zeeq-un-nafas (Bronchial asthma), is a sincere attempt of the research workers of the Unit to redesignate the efficacy of trusted unani remedies, through, the course of intensive research. The present study is quite exhaustive, keeping in view the facilities available at the disposal of the Unit. The work is infact commendable.

I am sure that the physicians and people of our country and abroad, will find this study equally useful.

The Council places on record its gratitude to the authorities of Arignar Anna Govt. Hospital of Indian Medicine, Madras for provision of facilities.

(P.N.V. KURUP)
Director

PREFACE

Unani System of Medicine is a system of thought and practice and has grown out of the fusion of diverse thoughts and experiences of nations and countries with an ancient cultural heritage, namely Egypt, India, Iraq, Iran and China. This system is quite rich of its wealth and has a message of good will and hope for those who have lost the charm and confidence of their life due to various ailments. This system is as much scientific as any other branch of modern knowledge.

In consonance with the objects of the Council. the clinical trial on certain specific problems is being carried out at Clinical Research Unit (Unani) Madras. There are a number of remedies mentioned for Zeeq-un-Nafas, in Unani classics. Out of these trusted drugs, three drugs namely (A) Gajga (Karanjwa), (B) Karanj and (C) a compound-'Majoon-e-Zeeq' were taken up for trial. The studies have been carried out on conceptual grounds and in accordance with the principles of Unani System of Medicine. Keeping in view the facilities available and taking into account the various factors studied, the study can be claimed to be promising. On pilot study, the drug 'A' has been found antieosinophillic where as 'B' proved to be anti-spasmodic in the condition of Bronchial Asthma. I am quite confident that this work will provide a base for further trial of the Unani drugs and also accellerate the confidence of the masses in Unani remedies. For this work, the workers of the Unit deserve every appreciation.

I am indeed grateful to Dr. S.K. Khadri, ex-Project Officer of the Unit, who has all along been associated with this study. I also place on record my thanks to the Director of Indian Systems of Medicine, Tamil Nadu and the authorities of the A. A. Govt. Hospital of Indian Medicine, Madras, for facilities.

(DR. (MRS.) UMMUL FAZAL)
Assistant Director (Unani)

CONTENTS

		Page No.
I	Introduction	1
II	Material and Methods	2
III	Observation	12
IV	Results	14
V	Discussion	32
VI	Conclusion	33
VII	Summary.	34
VIII	Acknowledgements	35
	References	36

I Introduction

Under the scheme sponsored by the Central Council for Research in Indian Medicine and Homoeopathy, the Clinical Research Unit (Unani) functioning at Arignar Anna Govt. Hospital of Indian Medicine, Madras-29 has chosen a few raw drugs mentioned in the unani text books of medicine, for assessing their therapeutic value on a more scientific basis, on a very obstinate and recalcitrant disease, namely : ZEEQ-UN-NAFAS (bronchial asthma), which is widely prevalent in this area (Tamil Nadu). At present, the highly advanced modern medical science is not able to find a radical cure for this disease, as the aetiology is enigmatic. They are able to give only a transient, symptomatic relief, which is always followed by still more severe exacerbations. The modern researcher, are ceaselessly trying to find a specific remedy which will strike at the root cause of the disease.

The ancient unani practitioners who studied the behaviour of man in diseases have left us, a legacy of several volumes of clinical and therapeutic knowledge based on their minute and critical observations and practical experience. For diseases with no known aetiology, if a remedy gives some temporary or partial relief, the modern medical science defines it as empirical remedy. But Unani system of medicine formulates a recipe for a particular disease on the basis of humoral derangement on the background of the original psycho-somatic, personality concept of the patient. Based on this concept, which forms the bed rock of the study of the principles of physiology, pathology, pharmacology and therapeutics, the ancient unani medical science was practised.

In Unani medical books, several recipes which have beneficial effect in mitigating the sufferings of the patients who suffer from the above said disease have been described. Those remedies are holding their popularity even today inspite of several latest drugs invented and introduced for these disorders by the modern medical

science. The drugs now selected have been studied on the above mentioned disease on scientific methods to verify their established efficacy.

The unani system of medicine is a collection of ancient, practical knowledge gained through vast experience of several centuries, preserved and handed over to the posterity for the welfare of humanity. It is possible to review and prove to the scientific world, the practical wisdom of the ancient medical savants, by utilising the present day scientific pharmacological methods. The development of this system suffered a temporary set back due to some authors by concealing their vast knowledge without letting known to the posterity.

The present day pathologists consider the disease as an experiment conducted by nature, but they declare that they are ignorant under what condition it is conducted. It is an accepted fact that every living being is constantly being moulded by the hammer strokes of the environment. The unani physicians were adepts in comprehending the inseparable, interrelationship of the spirit, intellect, mind, body and environment. The psychosomatic concept of disease was very well known to them, that is why, besides, medicines for diseases, they prescribed some religious injunctions to be observed by the patients and their relatives to maintain mental tranquility. They are all aware that composed attitude of the patient, generates in him enough vitality to withstand and eliminate, the deleterious onslaughts of the offending disease processes. The human body is a unique self adjusting creation and the unani system of medicine depending upon the sources, occuring in nature, seeks to maintain, a healthy balance with entire body and mind, relying on the laboratory of the nature in the matter of medication.

Some of the authors of modern text books on pharmacology have gratefully acknowledged in their preface that most of the very useful drugs of vegetable origin, which cannot be replaced by any synthetic drug, have been taken from the folklore medicines, of course, they have analysed the crude drugs and separated the most important constituents and defined their dose, pharmacology and therapeutics on modern scientific methods. If any modern medical pharmacologist studies the recipes or the individual drug described in ancient materia medica with open mind, he may come to realise that the modern

inventions are nothing but the rediscovery of the past inventions. Therefore, the present study has ultimately succeeded in finding out some useful remedies of outstanding value in this disease.

The aim of this trial is to establish whether Majoon-e-Maghz-e-Gajga, Majoon-e-Maghz-e-Karanj and Majoon-e-Zeeq (Research Formula) resulted in improvement clinically, in patients with moderately severe Zeeq-un-nafas and that such therapy was free from undesirable side effects over a long period. The construction of the trial was double blind.

AIMS AND OBJECTS :

1. To demonstrate the efficacy of Majoon-e-Maghz-e-Gajga, Majoon-e-Maghz-e-Karanj and Majoon-e-Zeeq (research formula) in the treatment of Zeeq-un-Nafas.

2. To provide relief to patients suffering from this disease.

ZEEQN-UN-NAFAS (Bronchial Asthma)

Definition : Literally the word Zeeq-un-Nafas is composed of the words Zeeq and Nafas which mean Narrowing and Breathing respectively. In broader terms it is defined as the difficulty in breathing due to narrowing of the air passage, particularly in expiration, i. e. paroxysmal attacks of dyspnoea, chiefly expiratary in nature, associated with broncial spasm. 'Dama' 'Rabu' and 'Buhar' are other terms which are used for this condition as synonyms.

Breathing is the most primary and urgent human need, and when it requires conscious effort, violent emotional forces may be released. Therefore, when breathing becomes difficult, the patient promptly seeks the advice of his physician, and at this stage a satisfactory diagnosis as well as the relief is required.

In attemptng to evaluate symptoms of difficult breathing the physician must determine, whether dyspnoea is experienced on exertion only. or it is as aciated with symptoms of bronchial spasm, or it is entirely of emotional origin and associated with hyperpnoea (Hyperventilation syndrome).

Aetiology:

(a) Predisposing factors:

1. Heredity : 'Zeeq-un-Nafas' (bronchial asthma) runs in families
2. Sex : males predominate.
3. Age: Attacks usually start in childhood or early adult life.
4. Stimulation of the nerves from physical impulses, such as emotions, fatigue or the sight of artificial flowers'

(b) Proximate Causes:

1. Nazli Zeeq-un-Nafas may be due to Ghaleez lesdar balgham, getting formed in the body and infiltrating in the air passages.
2. Due to certain disorders of the heart, congestion of fluid takes place in the chest, causing difficulty in breathing.
3. General debility may also give rise to Zeeq-un-Nafas.
4. Zeeq-un-Nafas may be seen in the final stages of Tuberculosis of the lungs.
5. Warm-e.Riyah, (inflammation of lung tissue) may give rise to Zeeq-un-Nafas.
6. Zeeq-un-Nafas may also be caused due to 'Tashannuj' (spasmodic contraction) of Hijab-e-Hajiz (Diaphargm).
7. Zeeq-un-Nafas may also be due to abnormal function of the centres of nervous system that are otherwise responsible for rythmic action of respiratory organs.

Pathology:

Ghisha (Mucous Membrane) 'Urooq-e-Shariyah (capillaries) and Urooq-e-Khashina (Bronchioles) get congested due to Balgham ghair taba'i (Abnormal phlegm). Initially Zeeq-un-Nafas is due to "Warm -e- Riyah' (Inflammation of the lung) which is followed by exudation of Balgham Ghair-Tabai due to Hararat-e-ghair taba'i (Abnormal heat)

When reduced to simple terms, an asthmatic (Zeeq-un Nafas) seizure is caused by spasm of the smooth muscle of the bronchi and also due to mucosal oedema. The Bronchial lumen, normally is dilated during inspiration and narrowed during expiration, but when the attack of episode of spasm and oedema occurs, the lumen of the bronchi and bronchioles, becomes functionally constricted, especially during expiration and requires a positive force to squeeze out and expire the retained air. Under normal conditions, the elastic recoil of the lung is adequate to dispose of exhaled air, making expiration purely passive process, Nature has not provided man with powerful muscles of expiration ; the intercostal muscles are weak and the diaphragm is strictly an inspiratory muscle that ascends only because of intraabdominal pressure and the elastic recoil of the lungs.

During the attack, there is an abnormal outpouring of mucous and oedematous fluid (abnormal phlegm) in the bronchi, which, because of its high viscosity, adds grately to the factor of mechanical obstruction.

Signs and Symptoms :

The asthmatic paroxysm consists of an acute dyspnoea of expiration, air being admitted into the lungs with reasonable ease, but exhaled only with effort. During expiration there are loud whistling, squeaking and groaning sounds, called musical rhonci. These sounds may be heard by associates of the patient, and are usually heard by the patient himself, but sometimes they are noted only by the physician on auscultation. Cough may be prominent and is usually troublesome.

During an attack, the patient usually sits forward with the head resting on the hands and the elbows on the knees. The face is pale and the expression anxious or alarmed. There may be cynosis of the lips and ears, the breathing is laboured, short and jerky, inspiration being followed by very prolonged and feeble expiration. The pulse is rapid and often weak during the attack. The blood may show raised eosinophills, up to 50%. The attack may last for 2 hours or longer, and the patient remains wheezy for 1 or 2 days. After the attack, he often falls asleep and exhausted.

In typical cases, the attack occurs at midnight or in the early hours of the morning. The patient goes to bed apperently well but awakes at about 2 A.M., with shortness of breath. He sits up in bed or may try to get near an open window.

Differential Diagnosis :

Other types of paroxysmal dyspnoea must be excluded.

(a) Zeeq-un-Nafas Qalbi : where respiration is not prolonged but rapidly accompanied by thirst, the condition is called 'Zeeq-un-Nafas Qalbi' (Cardiac Asthma).

(b) Nafas-e-Buka ; In certain types of Zeeq-un-Nafas, the nature of breathing is described as Nafas-e-Buka. The breathing in this symptom group is as if a person is weeping, the pulse is soft and patient is highly debilitated.

(c) Zeeq-un-Nafas-e-Kuliyah : (Renal Asthma) : In this group of cases, there is a history of renal trouble and morning swelling of the eyelids which disappears in the evening.

(d) Naqs-nd-dam (Anaemia) : In this group of cases the patient is usually pale having puffiness on the face with a weak appearance. In such cases dyspnoea on slight exertion with tachycardia, is also present.

(e) There may be thirst. Breathing sounds are fine. There is cough but mucous is not expelled due to narrowing and constriction of bronchioles and when liquifying drugs are given there is reliet in Zeeq-un-Nafas. This condition stimulates in part, chronic bronchitis (Sual-e-Muzmin), eosinophillic lung. (Zood-Hassasiyat) and latent tuberculosis (Sil)

(f) Zeeq-un-Nafas Shirki : This type of Zeeq-un-Nafas is some times due to Warm-e-lauzatain and Warm-e-ghudood (enlarged tonsils and adenoids) restricting inflow and outflow of air, Chronic dyspepsia also causes difficulty in-breathing, which simulates Zeeq-un-Nafas.

(g) Zeeq-un-Nafas Arzi : Where 'Zeeq-un-Nafas' is the symptoms without the usual causes of 'Zeeq-un-Nafas', this state is known as Zeeq-un-Nafas Arzi.

(h) Intisab-un-Nafas : It is a condition in which a person is unable to breath, until he stands up and extends his neck upwards and backwards. This condition is regarded as a very severe type of 'Zeeq-un-Nafas' and probably. this condition may be associated with 'Aneurysmal' disorder of 'Aorta.'

Course and Complications :

The course in adults is usually progressive, the attacks becoming more frequent unless some effective means are found for checking them. In children, however, 'Zeeq-un-Nafas' may cease spontaneously for no apparent reason.

Complications include Zeeq-un-Nafas Qalbi—(Cardiac Asthma) Istasqa-e-Lahmi (Congestive cardiac failure) and Intisab-un-Nafas (Probably this condition may be associated with Aneurysmal disorders of Aorta). Pulmonory tuberclosis may be associated with Zeeq-un-Nafas.

Prognosis :

This is good during an attack, as although, the patient often looks and feels morbid, death rarely occurs. Zeeq-un-Nafas, however, tends to shorten life, owing to complications, and is a very crippling disability.

Investigations :

(a) Radiological : X-ray chest : To exclude other lung's and heart,s conditions from Zeeq-un-Nafas

2. Other E.N.T. conditions to exclude septic foci.

(b) **Laboratory Invistigation**

(i) Urinalysis : Macroscopical : Microscopical : routine examinations

(ii) Faeces examination : To ecxlude ova or cyst.

(iii) Sputum : For A.F.B—for Tubercle bacilli and for the predominating organisms.
(iv) The vital capacity
(v) Blood : T.L. C
D. L. C
E.S.R.
Hb%
R.B.C-count

Parameters :

The following parameters were adopted in selecing the case of Zeeq-un-Nafas.

1. Taweel Daura-e-Tanaffus Tashannuji (status asthmaticus)
2. Symptoms of sual (cough) Kharkharahat (wheezing), Tangi-e-Tanaffus (dyspnoea)
3. Tangi-e-Tanaffus dauran-e-Harkat (dyspnoea on active movement)
4. Tangi-e-Tanaffus dauran-e-Sukoon (dyspnoea on passive movement)
5. Zacd-Hassasiyat (eosinophillic count)
6. Cases resembling Zeeq-un-Nafas were excluded from the study by laboratory investigations.

For assessment of the results the following criteria has been laid down.

		points allotted	Total points
(i)	No status asthmaticus	30	
(ii)	No cough, wheezing dyspnoea	30	
(iii)	No dyspnoea on active movement	10	
(iv)	No dyspnoea on passive movement	10	
(v)	Reduction in Eosinophillia	20	100

Drugs Used :

The following drugs were used in Zeeq-un-Nafas (bronchial asthma), the composition of which is also given below for 1000 gm.

a) Majoon-e-Maghz-e-Gajga

(Kernel of Cesalpinia Bonducella)	333 gm.
Honey	1000 gm.

b) Majoon-e-Maghz-e-Karanj

(Kernel of Pongamia Glabra)	333 gm.
Honey	1000 gm.

c) Majoon-e-Zeeq (Research formula)

A. GAJGA (KARANJWA) Hot 3^0 Dry 3^0

Persian :	Khayah-e-Iblis
English :	Fevernut
Arabic :	Akitmakit
Hindi	Katkaranj
Sanskrit :	Puttikaranja
Tamil :	Kazhar shikkay
Botanical name :	Caesalpinia bonducella

Habitat : A climbing shrub common throughout India, near the sea coasts, especially all over Bengal, Bombay and those of South India.

Parts used : Seeds or nuts, root, bark and leaves.

Action and uses : Seeds or nuts are valuable in simple continued and intermittent fevers, asthma, colic, anthelmintic and antispasmodic.

Powdered seeds smoked in Hukka cure colic, seeds are useful for dispersing swellings, restraining haemorrhage and keeping off infectious diseases. A decoction of the roasted seeds is used against asthma.

B. KARANJ Hot 2^0 Dry 2^0

English	:	Indian beach
Hindi	:	Karanj

Tamil	:	Pungamaram
Botonical name	:	Pongamia glabra

Habitat : This tree is common all over India and met with from Central Himalayas to southern India and Ceylon.

Parts used : Seeds, stem, leaves fruit, root and oil from the seeds.

Action and uses : Antiseptic, stimulant antiparasitic- Pods are worn round the neck in whooping cough, seeds of karanj are used as specific for whooping cough and harassing cough. It is also commonly used in bronchitis, whooping cough and a strong generative of phlegm (expectorant).

Flowers are used as a remedy for diabetese.

MAJOON-E-ZEEQ (Research formula)

COMPOSITION :

	Drugs with Botanical name	*English name*	*Quantity*	*Therapeutic Action*	*Temperament*
1.	Katan (Linum usitatissimu)	Linseed	28 gm.	(a) Expectorant (b) Anti inflammatory	Hot 2^0 dry 2^0
2.	Tukhm Hulba (Trigonella foenum graecum)	Fenugreek	56 gm.	Blood purifier	,,
3.	Seer (Allium sativum)	Garlic	84 gm.	Antiseptic	,,
4.	Chilbeenj (Strychnos potatorum)	clearning nut	168 gm.	(a) Expectorant	,,
5.	Asal (Honey) Add		654 gm.	(b) Antispasmodic	

II Material and Methods

On admission to the trial, no patient was on any medicament. Patients were randomly allotted to treatment in three groups with either Majoon-e- Maghz-e-Gajga, Majoon-e-Maghz Karanj and Majoon-e- Zeeq (R.F.), with a placebo respectively. The placebo contains wheatbran with honey. Each dose of Majoon was 10 gms given twice a day for 21 days.

Patients were considered suitable for the trial if their Asthma was of such severity as to warrant hospital admission for stablisation on Majoon-e-Maghz-e-Gajga, Majoon Maghz-e-Karanj and Majoon-e-Zeeq (R.F.). Pregnent patient and patients with other respiratory or cordiac diseases were excluded.

An initial one week period was spent in hospital. During this period investigations were performed and all the patients were kept on placebo.

Initial follow up was at fortnightly intervals. Later attendance was monthly for a period of 2 years. The follow up of the patients was carried out in the form of a questionnaire which was sent to the patients by post requesting them to report in the out-patient department. Most of the cases who present personally in the out-patient are completely checked with laboratory investigation and record. How ever, Some of the patients, reported their progress throngh the follow up card, which they sent by post.

III Observation

The observation on the follow up cases were recorded which are as follows :

1. **Majoon-e-Maghz-e-Gajga** : This compound is accidentally found to be as daf-e-Zood-e-Hassasiyat (anti eosinophillic) drug where highest percentage of eosinophillic count has remarkably reduced to normal ie. it is proved very effective both clinically and by the laboratory investigations as an anti eosinophillic drug. No toxicity has been observed.
2. **Majoon-e-Maghz-e-Karanj** : This compound is used as Daf-e-Tashannuj (antispasmodic). The results are encouraging, no toxicity has been observed but in winter season a few cases have reported, relapses in their conditions.
3. **Majoon-e-Zeeq** (Research formula) as long as the patient was treated with this compound, as in-patient, he was relieved of his symptoms but on follow up, the relapse in condition has been noted with or without "status asthamaticus".

30 patients (15 males+15 females) were admitted in three groups. In all 30 patients in each group completed the 21 days of therapy and equal number of patients, in each group, were in the placebo group-

The age range of the three groups was 12 to 60 years with a mean of 30 years.

The following table gives the seasonal incidence of Zeeq-un-Nafas and age distribution in the 90 patients selected for the study.

Age	*Season*	*Remarks*
12 to 25 years	prevalent throughout the year, but especi-	In Tamil Nadu, the incidence of this disease occ-
26 to 45 years	ally during the month of Octobar, November,	urs mostly among all the (poor) classes of all casts
46 to 60 years	ber, December and January	and creeds. Males are more affected than females. Another point of interest is that this disease is hereditary.

IV Results

No. of cases allotted=90, Total no. of cases treated=90 (Males=45+females=45) which comprises Group A,B,C with age group 12 years to 60 years.

The following chart shows the comparative symptomatic condition : 1. Before treatmen 2. After trentment.

GROUP A : MALE

MAJOON-E-MAGHZ-E-GAJGA

Before Treatment

S.N.	Age	Status asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on Active movement	Dyspnoea on passive movement	Blood Eosinophil
1.	35	—	+	+	+	+	+	20%
2.	25	—	+	+	+	+	+	15%
3.	46	—	+	+	+	+	+	14%
4.	55	—	+	+	+	+	+	32%
5.	42	—	+	+	+	+	+	20%
6.	45	—	+	+	+	+	+	20%
7.	28	—	+	+	+	+	+	22%
8.	13	—	+	+	+	+	+	20%
9.	55	—	+	+	+	+	+	31%
10.	45	—	+	+	+	+	+	20%
11.	38	—	+	+	+	+	+	15%
12.	28	—	+	+	+	+	+	56%
13.	45	—	+	+	+	+	+	80%
14.	45	—	+	+	+	+	+	22%
15.	15	—	+	+	+	+	+	15%

MAJOON-E-MAGHZ-E-GAJGA

Group A : Male

After Treatment

S.No.	Age	Status asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on active movement	Dyspnoea on passive movement	Blood Eosinophil	Score
1.	35	—	—	—	—	—	—	7%	94%
2.	25	—	—	—	+	+	—	10%	92%
3.	46	—	—	—	—	—	—	6%	94.5%
4.	55	—	—	—	—	—	—	4%	92%
5.	42	—	—	—	—	—	—	8%	92%
6.	35	—	—	—	—	—	—	8%	94%
7.	28	—	—	—	—	—	—	8%	92%
8.	13	—	—	—	—	—	—	8%	90%
9.	55	—	—	—	—	—	—	6%	90%
10.	45	—	—	—	—	—	—	6%	85%
11.	38	—	+	+	—	+	—	6%	60%
12.	28	—	+	+	—	+	—	13%	70%
13.	45	—	+	+	—	+	—	13%	72%
14.	45	—	+	+	—	+	—	12%	70%
15.	15	—	+	+	—	+	—	10%	33%

MAJOON-E-MAGHZ-E-GAJGA

Group A : Female

Before Treatment

S.No.	Age	Status asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on active movement	Dyspnoea on passive movement	Blood Eosinophil
1.	12	—	+	+	+	+	+	13%
2.	40	—	+	+	+	+	+	14%
3.	17	—	+	+	+	+	+	12%
4.	20	—	+	+	+	+	+	22%
5.	40	—	+	+	+	+	+	12%
6.	15	—	+	+	+	+	+	15%
7.	40	—	+	+	+	+	+	15%
8.	15	—	+	+	+	+	+	14%
9.	40	—	+	+	+	+	+	14%
10.	40	—	+	+	+	+	+	14%
11.	18	—	+	+	+	+	+	12%
12.	35	—	+	+	+	+	+	32%
13.	15	—	+	+	+	+	+	44%
14.	25	—	+	+	+	+	+	24%
15.	12	—	+	+	+	+	+	28%

MAJOON-E-MAGHZ-E-GAJGA

Group A : Female

After Treatment

S.No.	Age	Status asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on active movement	Dyspnoea on passive movement	Blood Eosinophil	Score
1.	12	—	—	—	—	—	—	7%	100%
2.	40	—	—	—	—	—	—	8%	96%
3.	17	—	—	—	—	—	—	4%	92%
4.	20	—	—	—	—	—	—	10%	90%
5.	40	—	—	—	—	+	—	8%	85%
6.	15	—	—	—	—	+	—	5%	85%
7.	40	—	—	—	—	—	—	8%	85%
8.	15	—	—	—	—	—	—	7%	85%
9.	40	—	—	—	—	—	—	6%	100%
10.	40	—	—	—	—	—	—	6%	100%
11.	18	—	+	—	—	+	—	4%	(4%
12.	35	—	+	—	—	+	—	12%	72%
13.	15	—	+	+	+	+	—	39%	21%
14.	25	—	+	+	+	+	—	19%	30%
15.	12	—	+	+	+	+	—	20%	32%

MAJOON-E-MAGHZ-E-KARANJ

Group B : Male

Before Treatment

S. No.	Age	Status asthmaticus	Cough	Wheezing	Dyepnoea	Dyspnoea on Active movement	Dyspnoea on passive movement
1.	25	—	+	+	+	+	+
2.	45	—	+	+	+	+	+
3.	45	—	+	+	+	+	+
4.	23	—	+	+	+	+	+
5.	28	—	+	+	+	+	+
6.	18	—	+	+	+	+	+
7.	37	—	+	+	+	+	+
8.	24	—	+	+	+	+	+
9.	25	—	+	+	+	+	+
10.	20	—	+	+	+	+	+
11.	25	—	+	+	+	+	+
12.	14	—	+	+	+	+	+
13.	23	—	+	+	+	+	+
14.	30	—	+	+	+	+	+
15.	60	—	+	+	+	+	+

MAJOON-E-MAGHZ-E-KARANJ

Group B : Male — **After Treatment**

S. No.	Age	Status asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on active movement	Dyspnoea on passive movement	Score
1.	25	–	–	–	–	–	–	100%
2.	45	–	–	–	–	+	–	80%
3.	45	–	–	–	–	–	–	100%
4.	23	–	+	–	–	–	–	90%
5.	28	–	–	–	–	+	–	90%
6.	18	–	+	–	–	–	–	80%
7.	37	–	–	–	–	+	–	90%
8.	24	–	–	–	–	–	–	90%
9.	25	–	–	–	–	–	–	90%
10.	20	–	+	–	–	+	–	90%
11.	25	–	+	–	–	+	–	80%
12.	14	–	–	–	–	–	–	100%
13.	23	–	–	–	–	–	–	100%
14.	30	–	+	+	–	+	–	50%
15.	60	–	×	+	–	+	–	40%

MAJOON-E-MAGHZ-E-KARANJ

Group B : Female

Before Treatment

S.No.	Age	Status asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on active movement	Dyspnoea on passive movement
1.	14	—	+	+	+	+	+
2.	25	—	+	+	+	+	+
3.	17	—	+	+	+	+	+
4.	45	—	+	+	+	+	+
5.	14	—	+	+	+	+	+
6.	25	—	+	+	+	+	+
7.	40	—	+	+	+	+	+
8.	37	—	+	+	+	+	+
9.	37	—	+	+	+	+	+
10.	30	—	+	+	+	+	+
11.	45	—	+	+	+	+	+
12.	28	—	+	+	+	+	+
13.	25	—	+	+	+	+	+
14.	43	—	+	+	+	+	+
15.	18	+	+	+	+	+	+

MAJOON-E-MAGHZ-E-KARANJ

Group B : Female

After Treatment

S.No.	Age	Status asthama-ticus	Cough	Wheezing	Dyspnoea	Dyspnoea on active movement	Dyspnoea on passive movement	Score
1.	14	—	—	—	—	—	—	100%
2.	25	—	—	—	—	—	—	100%
3.	17	—	—	—	—	—	—	100%
4.	45	—	+	—	—	+	—	80+
5.	14	—	+	—	—	+	—	80%
6	25	—	+	—	—	—	—	90%
7.	40	—	+	—	—	+	—	90%
8.	37	—	—	—	—	+	—	9 ,%
9.	37	—	—	—	—	+	—	90%
10.	30	—	—	—	—	+	—	85%
11.	45	—	—	—	—	—	—	90%
12.	28	—	—	—	—	—	—	100%
13.	25	—	—	—	—	—	—	96%
14.	43	—	+	+	—	+	—	60%
15.	18	—	+	+	—	+	+	28%

MAJOON-E ZEEQ (RESEARCH FORMULA)

Group C : Male **Before Treatment**

S.No.	Age	Statue asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on active movement	Dyspnoea on passive movement
1.	53	—	+	+	+	+	+
2.	48	—	+	+	+	+	+
3.	56	—	+	+	+	+	+
4.	54	—	+	+	+	+	+
5.	55	—	+	+	+	+	+
6.	53	—	+	+	+	+	+
7.	60	—	+	+	+	+	+
8.	19	—	+	+	+	+	+
9.	60	—	+	+	+	+	+
10.	55	—	+	+	+	+	+
11.	60	—	+	+	+	+	+
12.	45	—	+	+	+	+	+
13.	42	—	+	+	+	+	+
14.	18	—	+	+	+	+	+
15.	54	—	+	+	+	+	+

MAJOON-E-ZEEQ (RESEARCH FORMULA)

Group C : Male

After Treatment

S.No.	Age	Status asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on active movement	Dyspnoea on passive movement	Score
1.	53	—	+	—	—	+	—	80%
2.	48	—	—	—	—	+	—	90%
3.	56	—	+	—	—	—	—	90%
4.	54	—	+	—	—	—	—	90%
5.	55	—	+	—	—	—	—	90%
6.	53	—	+	—	—	+	—	80%
7.	60	—	+	—	—	—	—	90%
8.	19	—	—	—	—	+	—	80%
9.	60	—	—	—	—	+	—	80%
10.	55	—	—	—	—	+	—	80%
11.	60	—	+	—	—	—	—	90%
12.	45	—	+	+	—	+	—	50%
13.	42	—	+	+	—	+	—	60%
14.	18	—	+	+	—	+	—	38%
15.	54	—	+	+	—	+	—	38%

MAJOON-E-ZEEQ (RESEARCH FORMULA)

Group C : Female

Before Treatment

S.No.	Age	Status asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on active movement	Dyspnoea on passive movement
1.	45	—	+	+	+	+	+
2.	55	—	+	+	+	+	+
3.	54	—	+	+	+	+	+
4.	60	—	+	+	+	+	+
5.	55	—	+	+	+	+	+
6.	43	—	+	+	+	+	+
7.	50	—	+	+	+	+	+
8.	60	—	+	+	+	+	+
9.	35	—	+	+	+	+	+
10.	50	—	+	+	+	+	+
11.	40	—	+	+	+	+	+
12.	45	—	+	+	+	+	+
13.	60	—	+	+	+	+	+
14.	50	—	+	+	+	+	+
15.	35	—	+	+	+	+	+

MAJOON-E-ZEEQ (RESEARCH FORMULA)

Group C : Female

After Treatment

S.No.	Age	Status asthmaticus	Cough	Wheezing	Dyspnoea	Dyspnoea on *active* movement	Dyspnoea on *passive* movement	Score
1.	45	—	+	—	—	—	—	90%
2.	55	—	—	—	—	+	—	90%
3.	54	—	—	—	—	+	—	90%
4.	60	—	+	—	—	+	—	80%
5.	55	—	—	—	—	—	—	100%
6.	43	—	+	—	—	—	—	80%
7.	50	—	—	—	—	—	—	100%
8.	60	—	+	—	—	—	—	90%
9.	35	—	—	—	—	—	—	96%
10.	50	—	+	—	—	—	—	80%
11.	40	—	—	—	—	—	—	100%
12.	60	—	+	—	—	+	—	70%
13.	60	—	+	—	—	+	—	70%
14.	50	—	+	—	—	+	—	70%
15.	35	—	+	+	—	+	—	34%

Aver age Daily Symptom Score :

The symptoms like cough, wheezing, dyspnoea, dyspnoea on active movement, dyspnoea on passive movement, reduction in eosinophillia and status asthmaticus were recorded during the day and also during the night. When the patient is having relief in cough he is considered to have the score of 10, for relief in wheezing 10 and for relief in dyspnoeal 10. In the same manner reduction of dyspnoea on active movement 10 and on passive movement 10 and so on for reduction in eosinophillia 20 and for reduction of status asthmaticus 30. When the patient scores up to 39% he is considered to have no relief, up to 40 to 79% partial relief, and 80 to 100% complete relief.

Results Based on Symptoms Score :

This study is based on the three groups of drugs mentioned above in the treatment of Bronchial Asthma (Zeeq-un-Nafas), after carefully selecting the patients from within the age group of 12 years to 60 years. The patients are grouped in three categories, A, B and C; each group comprising 15 males and 15 females. The drug 'A' is given in the form of Majoon in the doses of 10 gm. twice a day for 21 days, while the drugs B and C are also used similarly. A similar group of 30 patients in each batch is kept as a control to show the difference between the treated and non treated cases.

The results are very encouraging as shown by the long remission between the attacks. It is proved that some of the cases of high eosinophillia responded well to the drug of group 'A' (Majoon-e-Maghz-e-Gajga), and in future there is the possibility of using this drug in the treatment of eosinophillia.

Pharmacological Studies :

Animal experiment with the Drug Gajga (Karanjwa) (Caesalpinea bonducella) was carried out in the Department of Pharmacology, Government Stanley Medical College, Madras under the guidance of Professor Dr. G.M. Yahya and his assistants Dr. Mrs. Violet Rajagopal, Dr. Thyagarajan and Miss Prema. The studies were started since 6th June 1977.

Methop of Preparation-Kesearch Drug Extract :—

1. Cold Aqueous Extract (10%) :—

25 gms of the Crude drug (Gajga) was powdered and kept in a flask. To this added 250 ml. of distilled water and kept it overnight for 18 hours and filtered it to get a clear solution. This was preserved in a clean sterilised bottle and sent to the Department of Pharmacology, Stanley Medical College with a label-Name of the Drug-10% of Cold Extract and quantity.

2. Hot Aqueous Extract (10%) :—

Prepared as per methed given above but the boiling water was used.

EXPERIMENT I :—

Animal experiment with 10% of hot and cold aqueous solution of Gajga (Karanjwa).

1. 1 ml (100 mg) of Hot and Cold Aqueous solution of Karanjwa was taken and 2 drops were instilled in the left eyes of each of the two different rabits to observe any local effect and the pupillary size.

Obserations: —

1. No change in the pupillary size of the rabit with cold Aqueous solution.
2. Hot Aqueous solution, slight dilatation of the pupillary size after 15 mts. Hence there is a dilataion.

Experiment. II:

Three guinea pigs were chosen for the experiment and were numbered as *I, II & III*.

Animal. I : Used for control study (not received either the test drug or Histamine).

Animal. II : Received 1.5 mg of Histamine injected intraperitonially at 1.05 p.m.

Ob servation : at 1.15 p.m.
1. Less active
2. getting slight jerks
3. rapid respiration
4. restless
5. increase in body temperature

Animal. III : Received first 2 ml. of Hot Aqueous extract of the test drug injected I.P. at 1.07 P.M. after 10 mts i.e. 1.17 P.M., 1.5 mg. of Histamine was injected I.P.

Observation : at 1.50 P.M. 1. Passing motion
2. Animal active

By 3 P.M., the condition of the animal became normal, the animal was kept for observation for a longer period. The next day at 1.30 pm. Animal II & Animal III, were examined and found to be alive.

Experiment. III

Experiment on dog :

Experiment on the dog was carried out with a view :

(1) To study the effect on respiration (Broncho-dilatation effect)

(2) To study the effect on Blood pressure.

The Male dog weighing about 6 kg. was anaesthetised at 12 noon with 13.1 c.c. PARALOUHYDE (2.2 c.c. per kg. body weight), given intravenously. The animal anaesthatised at 12.30 p.m.

Experiment :

Kymograph experiment or Technique was employed.

Purpose :
1. To record normal respiration and to record the effect of the drug on respiration.
2. To record normal blood pressure and to study the drug effect on blood pressure.

Observation : After use of 3 ml, 4ml and 5 ml of Hot Aqueous solution by I. V., the following observations were made.

a. Corresponding degree of Broncho dilatation was observed. So the drug was proved as Broncho dilator drug.

b. The trend of bloood pressure after consuming 3 ml, 4 ml and 5 ml dose of hot aqueous solution was observed as fall in blood pressure.

c. Histamine which was used by I. V. at 1.45 p.m. was found to have produced the fall in B. P. even after the administration of hot aqueous solution extract. So the fall in B.P. was not due to the drug.

As the drug under trial is devoid of any anti Histaminic property, it can be used as Broncho dialtor in Bronchial Asthma.

Each case of ZEEQ-UN-NAFAS has been rated as not relieved, (up to 39%) partially relieved (40-79%) and completely relieved (80-100%) on the basis of the points allotted to the symptoms.

DRUG A

Sex & No. of cases treated			No. of cases getting No relief	Partial relief	Complete relief
Male	=	15	1 (6.7%)	4 (26.6%)	10 (66.7%)
Female	=	15	3(20.0%)	2 (13.3%)	10 (66 7%)
			Controlls—No Drug used		
Male	=	15	10(66.7%)	4(26.6%)	1(6 7%)
Female	=	15	10(66.7%)	2(13.3%)	3(20.0%)

DRUG B

Male	=	15	Nil (0%)	2(13.3%)	13(86.7%)
Female	=	15	1(6.7%)	1(6.7%)	13(86.7%)
			Controlls—No Drug used)		
Male	=	15	13(86.7%)	2(13.2%)	Nil (0%)
Female	=	15	13(86.7%)	1 (6.7%)	1 (6.7%

DRUG C

Sex & No. of cases treated		No. of cases getting	
	No relief	Partial relief	Complete relief
Male = 15	2(13.3%)	2(13.3%)	11(73.4%)
Female = 15	1 (6.7%)	3(20.0%)	11(73.4%)
Controlls—No Drug used			
Male = 15	11(73.4%)	2(13.3%)	2(13.3%)
Female = 15	11(73.4%)	3(20.0%)	1 (6.7%)

Statistical Analysis Report :

a) The total number of the cases of Zeeq-un-Nafas (Bronchial Asthma) in groups A., B. and C. which have been completed by this unit is 90. All the case sheets with complete day to day progress reports were submitted to the statistician of Dr. A. Lakshmipathi Research Institute, Adyar, Madras-20.

The statistician after studying completely each and every case-sheet of Zeeq-un-Nafas, made the following observations.

Each case of Zeeq-un-Nafas was rated as not relieved (up to 39%), partially relieved (40-79%) and completely relieved (80-100%) on the basis of the points allotted to the symptoms given below :

		Points
1.	No status asthamaticus	30
2.	No cough, wheezing and dyspnoea	30
3.	No dyspnoea on active movement	10
4.	No dyspnoea on passive movement	10
5.	Reduction in Eosinophillia	20

The distribution of cases with respect to no relief, partial relief and complete relief is given below :—

	No relief	Partial relief	Complete relief	Total
Males				
Group A	1 (6.7)	4 (26.6)	10 (66.7)	15
Group B	Nil (0)	2 (13 3)	13 (86.7)	15
Group C	2 (13.3)	2 (13.3)	11 (73.4)	15
Females				
Group A	3 (20.0)	2 (13.3)	10 (66.7)	15
Group B	1 (6.7)	1 (6.7)	13 (86.7)	15
Group C	1 (6.7)	3 (20.0)	11 (73.4)	15
Total (males and females)				
Group A	4 (13.3)	6 (20.0)	20 (66.7)	30
Group B	1 (3.3)	3 (10.0)	26 (87.7)	30
Group C	3 (10.0)	5 (16.6)	22 (73.4)	30

In group wise comparisons (X^2 test), it was observed that there exists no significant difference between the effects of treatments A,B and C.

"All the three treatments are equally effective"

* Figures in the parentheses represent percentages.

V Discussion

The pilot study on the efficacy of the drugs (A) Majoon-e-Maghz-e-Gajga, (B) Majoon-e-Maghz-e-Karanj and (C) Majoon-e-Zeeq(Research formula has been conducted on 90 patients of Zeeq-un-Nafas (Bronchial asthma) in three groups, each group consisting of 30 cases. for a period of 21 days with a similar number of patients as control after excluding the causes of eosinophillia like (a) worm infestation (b) skin diseases and other conditions. All the three preparations have been found to be effective. The statistical report, assessed by the statistician of Dr. A. Lakshimpathi Research Institute, Madras-20. testifies that "All the three Treatments are equally effective." All the drugs have got encouraging results, particularly, Majoon-e-Maghz-e-Gajga, which acts as an antieo-sinophillic drug. The results are highly encouraging in bringing down the percentage of eosinophil count to normal, and giving complete relief in the cases of Zeeq-un-nafas (Bronchial Asthma).

In group 'A', out of 30 cases treated with Majoon-e-Maghz-e-Gajga 10 gms. twice a day for 21 days, 66.7% had complete relief and 10.0% had partial relief when compared with the control.

In group B, out of 30 cases treated with Majoon-e-Maghz-e-Karanj 10 gms twice a day for 21 days, 86.7% had complete relief and 10.0% had partial relief when compared with the control.

In group C, out of 30 cases treated with Majoon-e-Zeeq (R.F.) 10 gms twice a day for 21 days, 73.4% had complete relief and 16.6% had partial relief, when compared with the control.

The above analysis indicates that a good number of cases responded to all the three groups of drugs. The cases have been followed up for the last two years and there was a relapse in 50% of the cases in group C only, where as there was no relapse in the other two groups ie, A and B.

20% of the patients have developed nutritional anaemia due to dietary restrictions imposed in an attempt to avoid real or fancied food allergies.

VI Conclusion

In view of the results achieved by this unit after studying 90 cases with these drugs, the study may be claimed as satisfactory. The satisfaction of the patients and also the sense of well being after treatment has proved the efficacy of the drugs. The statistical assessment referred to earlier made after going through the case records etc. also indicates the success of the trial.

One can conclude that these research drugs are definitely useful and can effectively serve the masses. These are also cheap and homely without any adverse effect. The percentage of complete relief in their symptoms was to the extent of 66.7 % to 86.7% which is a significant figure when compared to the control which gives relief only to the extent of 6.7% to 26.6%.

VII Summary

A double blind trial of Majoon-e-Maghz-e-Gajga, Majoon-e-Maghz-e-Karanj and Majoon-e-Zeeq (Research formula), in the control of Zeeq-un-Nafas Muzmin (Chronic Bronchial Asthma) is reported. The result shows that these are extremely effective therapeutic agents. The moderately severe Zeeq-un-Nafas (asthmatic) patients were well controlled on 10 gms. of Majoon-e-Maghz-e-Gajga Majoon-e-Maghz-e-Karanj and Majoon-e-Zeeq (Research furmula) twice a day for 21 days and the control was maintained over a period of two years without a relapse. This from of treatment has a few undesirable side effects such as nausea and dyspepsia. This is particularly suitable in the absence of the radical cure in the allopathic system of medicine. It is gratyfying to note that there was a reduction in Eosinophillic count from an average of 80 % to 6 %.

VIII Acknowledgements

Authors hereby acknowledge with a deep sense of gratitude, the valuable services rendered by the following in the successful implementation of the project of this unit.

1. The Central Council for Research in Indian Medicine and Homoeopathy, New Delhi for sponsering this unit and financing it,

2. The Government of Tamil Nadu and the Health Department for having provided beds, para-medical staff, diet, preparation of Research medicines in the pharmacy of Arignar Anna Govt. Hospital of Indian Medicine, Madras-29.

3. Hakeem Dr. Ahmed Hussain, H. P. I. M,

4. Dr. (Mrs) Ummul Fazal, Assistant Director (Unani), Central Council for Research in Indian Medicine and Homoeopathy for her valuable suggestions in recasting the monograph.

5. Dr. G. M. Yehya, M. B. B. S., M.Sc.- Professor and Head of the Pharmacology Department, Stanley Medical College, Madras.

6. Dr. K-Ramachandra, M, D', former Superintendent, Govt. General Hospital, Madras.

7. Mr. T. Koteswara Rao, Statistician, Dr. A. Lakshimipathi Research Institute, Madras for their active co-operation and valuable suggestions.

8. Hakeem Dr. Md. Habibullah; L. I. M., Medical Officer Arignar Anna Govt. Hospital of Indian Medicine, Madras-29

9. Dr. G. S. M. P. Khadri, B. Sc., M. B. B. S., Govt. General Hospital, Madras.

REFERENCES

1. Khazainul Adwiyah by Allama Hakim Najm-ul-Ghani
2. Bustanul Mufradat by Hakim Md. Abdul Hakim Saheb
3. Ilmul Adwiyah by Hakim Md. Kabiruddin
4. Tarjuma-e-Sharhe-e-Asbab-Volume I, II, III & IV by Hakim Md. Kabiruddin
5. Bayaz-e-Kabeer by Hakim Md. Kabiduddin-Volume I & II
6. Qarabadeen-e-Qadri-Part I & II
7. Kulliyat e-Qanoon-Part I & II by Hakim Md. Kabiruddin
8. The Madras Materia Medica by Mohiudeen Sheriff Khan Bahadur (Government of Madras Publication-1891)
9. Indian Materia Medica Valume I & II by K. M. Nadkerni
10. Medicinal Plants of India by Col-Chopra
11. Text book of medicine by Price
12. Text book of medicine by G. E. Beaument
13. Methodology of Clinical Research by Max Hamilton
14. Medical History & Medical care by Gordan
15. Chest Diseases by Keneth M. A. Derry
16. World Medical Research Principles & Entices by Harry Swiserland green
17. A review of clinical Research (1940-1960) by Sir Charles Justreu
18. Asthma-a guide for patient by K. Michal Huma.
19. Pocket Book of Physical Science in Medicine by H. Flud.

19. Preliminary techno-economic survey of natural resources and herbal wealth of Ladakh.

20. Tribal pockets of Nilgiris-Record of the Field Study on medicinal flora and health practices.

21. Arunachal Pradesh-Record of the medico-botanical survey team.

22. Medicinal Plants in the districts of Andhra Pradesh along the course of river Krishna.

23. Hand book of Medicinal Plants of India, Vol. I.

24. Seminar on Yoga, Science and Man.

25. Syllabus for Yoga Education for Schools and Colleges. (Hindi and Englsh)

26. Glimpses of Health and Medicine in Mauryan Empire.

27. Western Epitomes of Indian Medicine.

28. Union Catalogue of Arabic and Persian Medical Manuscripts in the Libraries of Hyderabad.

29. Library Catalogue - Author Catalogue (Part I)

30. Risala-e-Joodia (Urdu).

31. Ayurveda Oshadhi Nigandu (Sanskrit).

32. Uttarakhand Vanaushadhi Darshika

33. Clinical Study of Wajaul Mafasil.

PUBLICATION OF THE COUNCIL

1. Peruvoside and other cardiotonic glycosides of *Thevetia neriifolia* A. Juss.
2. Medicinal flora of certain districts of Uttar Pradesh Part I, II & III.
3. Check list of Sanskrit Medical Manuscripts of India.
4. Charucharya.
5. Provings of *Abroma augusta.*
6. Provings of Kalimur.
7. Hand book of common remedies in Siddha System of Medicine.
8. Theriyarkappiyan.
9. Pharmacognosy and Phytochemistry of *Ashwagandha (withania somnifera Dunal)*
10. Theriyartharu.
11. Pharmacodynamics of Musk.
12. Home Remedies Manual in Homoeopathy
13. Pharmacopoeial Standards for Ayurvedic formulations.
14. Hand book of Domestic medicine and common Ayurvedic remedies.
15. A Hand book of of common remedies in Unani System of Medicine. (Hindi & English)
16. Museum guide of exhibits on Indian Medicine at the Indian Institute of History of Medicine, Hyderabad, Part I & II.
17. Andaman and Nicobar Islands-record of the Medico-botanical survey team.
18. Medicinal plants of the districts of Andhra Pradesh along the course of Godavari.

Printed at : Fairdeal Advertisers, New Delhi-110003 Phone : 622397